

NEW BEES AND WASPS — PART XV

Bees from Two Mountains, with Description of a New Species
and Notes on the Biology of Another

By TARBTON RAYMENT, F.R.Z.S.

INTRODUCTION

Two male *Parasphecodes*, collected at Mt. Buffalo, Vic., and presented to the author by the courtesy of Mr. Hugh C. E. Stewart, of the Field Naturalists' Club of Victoria, raise the question of whether or not they could be males of *P. excultus* Ckll., described from Magnet, Tasmania, and which is not close to any other known species. The altitude of Mt. Buffalo would, of course, cancel the difference in latitude, so that the ecological factors would not be dissimilar. Until the relationship is established, the Victorian males may be known as the Gentian Bees, and the description is appended.

PARASPHECODES GENTIANAE

sp. nov.

TYPE, Male—Length 9 mm. approx. Black, with a long narrow red abdomen.

Head black, almost circular from the front; face with much long white hair; frons having a scale-like sculpture, and close puncturing; clypeus produced, with a yellow mark, and rough, coarse punctures; supra-clypeal area rising to a low carina that reaches the median ocellus; vertex shining, especially about the ocelli, long white hair; compound eyes reniform, converging below; genae rugoso-punctate, with white hair; labrum black; mandibulae black; antennae very long, black above, ferruginous beneath.

Prothorax not visible from above; pleura rugose; tubercles black, with a fringe of white hair; mesothorax with a delicate tessellate sculpture and shallow punctures, a few white hairs; scutellum similar; postscutellum rougher; metathorax rugose, area with coarse longitudinal rugae superimposed on a tessellate sculpture, some white hair laterally; abdominal dorsal segment 1 black, with a reddish margin; 2 red, with a black triangular mark, 3 similar, 4-5-6 black, with a red lateral spot, punctures minute, some white hair laterally; ventral segments 1 to 5 red, 6 black.

Legs very slender, black, with white hair; tarsi black, with yellowish hair; claws reddish; hind calcar amber; tegulae black, shining; wings hyaline; nervures brown, first recurrent just inside the second intercubitus, second cubital cell higher than wide, only slightly contracted at top; pterostigma brown; outer nervures not weakened; hamuli seven, weak.

Locality: Mount Buffalo, Victoria, April 8, 1950, Hugh C. E. Stewart.

TYPE in the collection of the author.

Taken on two successive days on flowers of *Gentiana sibirica*.

A BEE CHANGES ITS HABITS

Time, with his inexorable digestion of all things, reduces the toughest of timbers to utter decay. The golden fibres of its glorious life are, at last, part of the elemental mud of earth. The gracious tree returns to the soil that gave it birth.

I say the wood is reduced to earth, yes, indeed, for there is little left to distinguish one from the other. See, I pinch a trifle of the punk between my fingers—it collapses, and few tears of water well out, as though the debris wept for the departed glory of the forest.

I am not the only one to perceive this gradual transformation from life to death. The bees, too, as though to refute those naturalists labouring to convince us that bees are mere reflex mechanisms, begin to fill again with life the dissolving cells of the tree.

For untold aeons of time, andrenid bees have invariably sunk their shafts in the ground. True, it took over twenty years of my life to discover that simple phase of natural history, but no matter, I know that all the species I have studied laboriously sink shafts in the ground. They have always done so, for they are miners by inheritance, by anatomical structure, by the insistent urge of instinctive tropisms—geotropism—the instinct to delve down into the darkness of the earth.

Who knows the subtle laws that drive an industrious wild-bee suddenly to desert the ancestral site of the nest, a crude shaft in the earth, to bore horizontal galleries in the debris of wood above the ground.

Let us pass from mere speculation to proved demonstrable facts. I take up the letter from my correspondent to re-read the succinct account—"Today, while I was cutting the decaying stump of a messmate tree, *Eucalyptus obliqua*, I came across several wasps in their nests, which were made at the ends of grub tunnels. You will find their eggs attached to some substance. What is it? I thought they may be of interest to you".

Of course they are of interest. The insects proved to be not wasps, but Australian wild-bees. Not every day is the naturalist favoured with indubitable evidence of an insect's abandoning the habits of its family. As this is the first account of the nest of this species, we should give honour to whom honour is due, and credit Cliff. Beaglehole with its discovery.

The cells are built of a dark-brown woody pulp, and are of an even texture comparable only to a fine moist silt entirely free from pebbles, sand, and other alluvial debris. I take a cubic centimetre of the punk and drop it into water—it floats with the buoyancy of cork. A similar volume of soil sinks instantly, and disintegrates.

Let us look closer at this bee which defies tradition, and abandons

the traits and industry of her family. A little less than half an inch in length, say, five-tenths of an inch, with a shining black head and thorax, and a dark blood-red abdomen; the legs show a little red on the shins, and the wings are dark, as though some reddish smoke had stained their pristine clarity. True, the harvesting hair of the legs is not reddish, but rather a dull-ivory colour, a trifle of no importance.

And her name? She has no common title, no vernacular to trip easily from the tongue. The scientist knows her as *Parasphecodes Wellingtoni*, for my late beloved mentor, Professor Theo. Cockerell, received her first from Mount Wellington in Tasmania, and named her after that mountain.

What, then, is she doing at Gorae, ten miles west of Portland, on the southern coast of Victoria? I postulate that she was at Gorae a long, long time before she slowly worked her way south, and up the 2,000 feet slopes of the mountain in Tasmania. She was in Gorae before the turbulent waters of the ocean, forever biting away at the coastline, finally severed Tasmania from the mainland.

The bee is small, and her power of flight limited to a mere few hundred yards, the small number of hooklets joining the fore and hind wings assure me of her aerial limitations. No hive—or wild-bee—could cross the waters of Bass Strait.

The small oval cells measured 12 mm. at the long axis and 5 mm. at the short, and so conform to the architectural principles of the bee-world. They are symmetrical chambers, exquisitely finished on the interior with a draping of impalpable silvery tissue—the dainty cradles of the young.

What of the puddings in the cells? Examined critically, the store of food provided for the baby bee is reddish in colour on the exterior, and perfectly spherical, for bees, unlike man, are able to build them so without recourse to any rotary movement.

Dry and mealy, there is little honey in the puddings, nor is there any need for a richer sweet, such as the miraculous predigested pap of the bee-hive, for *Parasphecodes* is a simple but vigorous species, well able to survive when the last of the foreign honey-bees will have moulded into dust.

The puddings are aggregations of pollen-grains, and with the assistance of the microscope, I shall discover which plants are favoured by the bees, and shall also learn a little about the flora of Gorae by a critical study of the pollen-grains. We shall also discover what she did, and where she spent her time on a certain morning in September, 1950. It is an interesting study, and more ennobling than tracking down some unfortunate fellow-bee for his crime, although the methods used in both cases are much the same.

With a scalpel I slice the puddings in half. The interior is of a brilliant golden-orange colour, so let us endeavour to trace the source of the colour. I spread a few of the grains on a slide, and

examine them under a high power. So, there are numerous microscopic golden globules distributed among the pollen. I add a drop or two of ether—the globules quickly disappear. I put a few other grains on a slide, and apply a biological stain, Sudan red. There is no doubt at all, the golden colour is due entirely to the presence of oil—a delicate fatty product of the plants.

I mix each pudding to an even consistency with a drop of glycerine, and examine a little under the lens. The grains, now stripped of their golden covering, resemble tiny glassy beads; they are indubitably the male cells of an Australian native plant.

Let us fall back to a little simple science, and apply a micrometer to the pollen. The grains are plain spheres, each 20 microns in diameter; that is, 50 of them would lie along a line one millimetre in length.

Number 2 pudding contains similar grains, but there are two or three strange triangular ones, perhaps from a species of eucalypt, and one or two are shaped like a tiny grain of wheat, probably from some leguminous plant. The "foreigners" are purely an accidental contamination, which is to be expected of any devoted lover of the flowers.

Number 3 gives a similar result.

Number 4 is contaminated with an odd grain, perhaps four times longer, and shaped not altogether unlike a miniature raspberry. This time I know it came from a wattle of some kind.

Numbers 5 and 6 are similar. *Parasphacodes Wellingtoni* prefers some plant that yields golden spherical grains, and the collector should be able to furnish us with the botanical name, for the plant must be present in abundance.

The puddings have quickly dried quite hard. A pure honey and pollen mixture does not dry out, for the honey is hygroscopic, but the addition by the mother of some biological secretion alters the whole character of the pudding—and of the baby.

On each pudding is a small white egg, somewhat bowed. In a few days it will hatch, and a wingless, eyeless, legless grub begin its meal of golden pollen. Within a fortnight it will be fully fed, and then fall asleep for a month or two, until the miracle of metamorphosis is complete.

Three months later the restless males will emerge, and a few days after, the females will appear, for that is the invariable order of succession throughout the kingdom of the bees.

ERRATA

In "Victorian By-ways" (*Pict. Nat.*, April 1951), the following corrections are called for:

Page 244, lines 27 and 30, read *Palaeozoic* (not "Paleoic" or "Paleozic"); line 28, read *Mesozoic* (not "Mesozic"). Page 245, line 6, read *Derrinal* (not "Derinal"); line 9, read *Jurassic* (not "Turanic"); line 30, read *Kosciusko*.